Gamma+jet production

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Samples will consist from (Gamma + jet) + different background.

Background: jet + jet, where one of jets have leading:
gamma-brem, pi0, eta, omega, K_S0, e+-

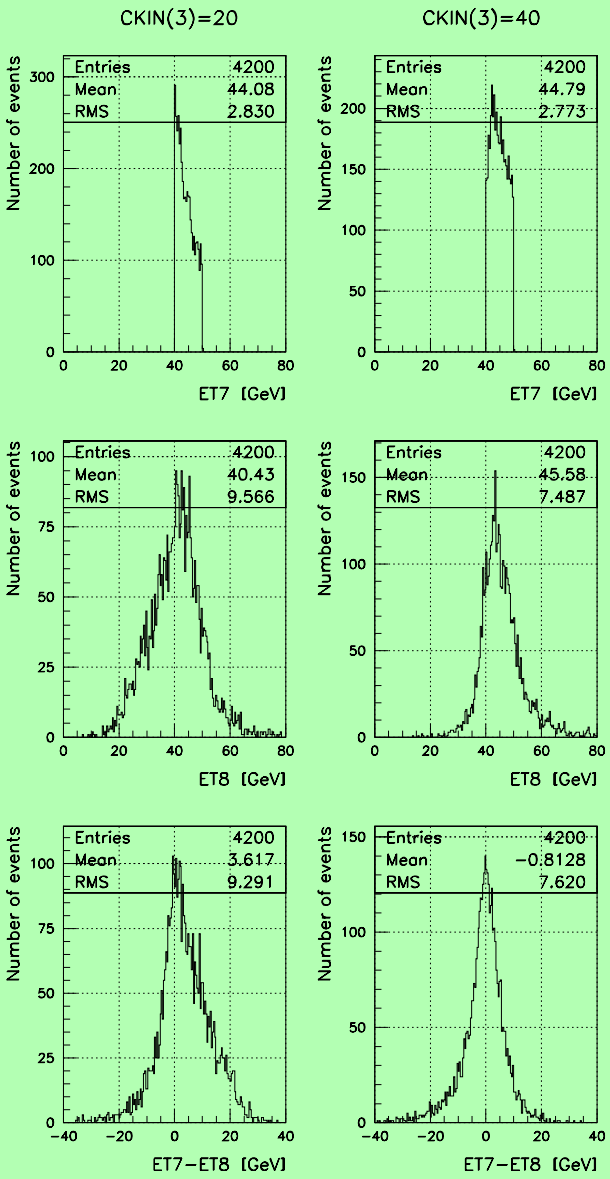
Samples:

1) CKIN(3) = 20 GeV

2) CKIN(3) = 40 GeV

3) CKIN(3) = 100 GeV

The first problem on generating with slices CKIN(3,4):



The task is to look for additional weights to readouts. Including backgr.

If CKIN(3)=20GeV

and PTgam > 40GeV
<ETgam-ETj>=4

if CKIN(3)=40GeV

and PTgam>40GeV
<ETgam-ETj>=-1

Balance distribution

becomes more narrow with shifted mean value.

Selection of "PTgam"=40-50 GeV with different CKIN(3) in mixed background (gamma+jet and background).

The second problem with ckin(3,4) slices:

For determination of additional weights we use fitting procedure where each event is at the same time measured point with some energy deposition in readouts.

Let's consider the event mixture from two ckin(3)-ckin(4) intervals taken with different weights:
Then minimization functional (for ex. chisquare) from

$$chisquare = \sum_i \frac{(ETgam_i - Erec_i)^2}{\sigma_i^2}$$

will be transformed to:

$$chisq = W_2 \times \left(\frac{W_1}{W_2} \times \sum_i \frac{(ETgam_i - Erec_i)^2}{\sigma_i^2} + \sum_j \frac{(ETgam_j - Erec_j)^2}{\sigma_j^2} \right)$$

where W1/W2>>1, if we generate the same number of events in each slice.

Each event from sample 1 will be included >>1 times in fitting procedure. Sample will not be random any more. The question is under which condition it can be allowed.

The first sum should have enough statistics, so that distribution on energy deposition in readouts is the true one. One should mention that it is not the number of event in sample 1, but the number of events from sample 1 that contributes to investigated energy interval of gamma.

So after doing reweighting one should prove that this procedure does not disturb the result. And for this one should generate full spectra and compare with generation via slices. Double work?

Next huge problem MSTP(82)=4!!!

To investigate ETgamma>40 GeV, we should generate CKIN(3)>20 GeV. With MSTP(82)=4 it will take 50 minutes/PYTHIA event or 120 days for 50 P800.

MSTP(82) increases the number of soft particles with PT<4 GeV.

Comparison between MSTP(82)=1 and MSTP(82)=4 on 1000000 events.

Table 1: Selected events

MSTP(82)	all	gamma-dir	gamma-brem	$\pi 0$	η	ω	K^0_S	e
1	2023	199	119	773	342	97	468	25
4	1699	168	118	526	229	51	374	13

MSTP(82) gives difference near 15% on numbers of selected. The question is the difference in jets.

Proposition:

1) generate gamma+jet and background sample with MSTP(82)=1.
and

For reference of calibration:
2 a) generate samples with pure gamma+jet events with MSTP(82)=4.
or
2 b) generate samples of pure gamma+jet with MSTP(82)=1 and with MSTP(82)=4 and look for the difference in reconstructed jets.